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Ben Fung,[1] Miguel Molico[2] and Gerald Stuber[1]

[1]Currency Department
[2]Financial Stability Department
Bank of Canada
Ottawa, Ontario, Canada K1A 0G9
bfung@bankofcanada.ca
mmolico@bankofcanada.ca
gstuber@bankofcanada.ca

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Abstract

The authors review recent developments in retail payments in Canada and elsewhere, with a focus on e-money products, and assess their potential public policy implications. In particular, they study how these developments will affect the demand for bank notes, and the central bank's balance sheet and its seigniorage revenue, which as a result might affect the central bank's ability to implement and conduct monetary policy and to promote financial stability. Other public policy issues, such as safety and efficiency, and user protection as well as legal, security and law enforcement, are also considered. While the demise of cash is not imminent, it is important for the central bank to continue to evaluate its potential roles with regard to e-money.

JEL classification: E41, E42
Bank classification: Bank notes; E-money; Financial services; Payment clearing and settlement systems

Résumé

Les auteurs analysent l'évolution récente des paiements de détail au Canada et à l'étranger, en se concentrant sur les produits de monnaie électronique, et évaluent leur incidence possible sur les politiques publiques. Plus particulièrement, ils étudient la façon dont les tendances observées influeront sur la demande de billets, ainsi que sur le bilan de la banque centrale et ses revenus de seigneuriage, ce qui pourrait avoir des répercussions sur la capacité de cette dernière de mettre en œuvre sa politique monétaire et de promouvoir la stabilité financière. Ils examinent également d'autres enjeux des politiques publiques, notamment la fiabilité et l'efficience, ainsi que la protection de l'usager, la sûreté, l'application de la loi et des questions d'ordre juridique. Bien que la disparition de l'argent comptant ne soit pas imminente, il est impératif que la banque centrale continue d'évaluer les rôles qu'elle pourrait jouer dans l'utilisation de la monnaie électronique.

Classification JEL : E41, E42
Classification de la Banque : Billets de banque; Monnaie électronique; Services financiers; Systèmes de compensation et de règlement des paiements

Summary

- For the purposes of our discussion in this paper, we define e-money as: monetary value stored electronically on devices such as a chip card or a hard drive in personal computers or a server, represented by a claim on the issuer, which is issued on receipt of funds for the purpose of making payment transactions, and which is accepted by persons other than the issuer.
- Globally, adoption of e-money products has been slower than expected and there has been a diversity of experiences in regard to success and failure. Most successful innovations tend to be concentrated in cash-intensive economies and filling specific gaps or niches. In Canada, few e-money products are currently available or broadly used. So far, most competition for cash has come from traditional electronic payment instruments such as debit and credit cards.
- While the share of payments using cash has declined, notes-in-circulation have been growing more or less in line with the economy in many countries, including Canada. Looking forward, the impact of wider adoption of e-money on the use of cash is unlikely to be very strong in the near term. The Bank needs to continue to monitor developments in retail payments, and to better understand the demand for bank notes as well as payment choices and behaviour.
- Controlling for interest rates, over the past 20 years, seigniorage revenue has remained relatively stable (about 0.07% of GDP). While a significant loss of revenue could raise concerns regarding the Bank's operational independence, such a large decline in the demand for cash is unlikely in the foreseeable future.
- Even a significant shrinkage of the Bank's balance sheet is unlikely to impair its ability to conduct monetary policy as long as there continues to be a demand for Bank settlement balances. However, some adjustments might be required in the way monetary policy is implemented. A shrinking balance sheet could also negatively affect the Bank's ability to intervene in the financial market during periods of unusual financial stress. There are several policy options to mitigate such a shrinkage, most of which would require legislative changes.

- Future retail payment innovations are likely to involve non-banks and new business models, posing new oversight and regulatory challenges. There is a need for a comprehensive regulatory regime surrounding e-money schemes that appropriately balances public policy objectives, such as efficiency, safety and user interests.
- Although it is unlikely that e-money issued by the private sector would pose any systemic risk to the financial system, there is the potential that the failure of a large e-money issuer could lead to a major disruption to the economy (system-wide risk) and have negative reputational consequences for the Bank or other authorities. There is a need to ensure the safety of the funds in the e-money scheme and that there is a sufficient level of transparency regarding the rights and obligations of all parties involved, including consumers, retailers, issuers and operators.
- New e-money products also raise legal, security and law enforcement concerns. Many of the features relevant to the convenience and security of e-money may increase its attractiveness for money laundering and other criminal activities. The cross-border nature of some e-money schemes makes this a particularly challenging issue requiring international coordination and co-operation.
- So far, central bank involvement as a facilitator or catalyst of e-money has generally been limited to research and monitoring, although some central banks are taking initiatives to promote standardization, best practices and interoperability.
- Central banks' involvement as regulators or overseers of retail payments has evolved significantly in recent years. Currently, several central banks have oversight of not only systemically important payments systems but also of retail payments systems of "system-wide" importance.
- There seems to be no compelling case for the central bank to issue e-money directly, if a well-regulated system of private sector e-money schemes can be established. In any case, the decision for the central bank or other public institutions to issue e-money should be grounded on public policy arguments.

1 Introduction

A number of developments are increasing the potential for major changes in the retail payments landscape in Canada. New technology and new business models are changing the way people pay for their purchases. In most cases, these developments accelerate the substitution to electronic means of payment from cheques and cash. Also, there have been increased public discussions about retail payment issues in Canada and internationally, and these discussions could result in changes in payments system governance, infrastructure and policy.[1] The Bank of Canada needs to understand and anticipate these developments and their implications for both the Bank and other public authorities.

The main objectives of the Bank's research on electronic money and payments are: first, to deepen our understanding of electronic money and payments as digital alternatives to cash, and their likely evolution and pace of adoption; second, to better comprehend the issues and risks raised by an increased reliance on these alternatives; and third, to establish a view on the role of the Bank with respect to e-money.

The rest of this paper is organized as follows. Section 1.1 defines the term e-money and outlines the scope of our study. Section 2 summarizes recent developments in e-money and electronic payments and their implications for cash demand. Section 3 discusses the implications of digital alternatives to cash for monetary policy and financial stability intervention, and section 4 describes other public policy issues. Section 5 discusses the potential roles of the central bank with regard to e-money. The final section offers some concluding remarks.

1.1 Definition and scope

The term e-money is often used to refer to a wide variety of electronic payment schemes and thus it may mean different things to different people. Put simply, e-money is

[1] A notable example is the Task Force for the Payments System Review, appointed by the government in 2010, which had launched an online public consultation and met with industry stakeholders. The Minister of Finance has considered the Task Force's recommendations on how to guide the evolution of the payments system in Canada and has taken a number of actions, among them a review of the governance framework for the payments system.

monetary value stored in an electronic device that can be used to make payments. However, this definition is still quite general and could cover a wide range of electronic payment products. For the purposes of our discussion in this paper, we define e-money as: monetary value stored electronically on devices such as a chip card or a hard drive in personal computers or a server, represented by a claim on the issuer, which is issued on receipt of funds for the purpose of making payment transactions, and which is accepted by persons other than the issuer.[2]

There are three key elements in this definition: it is the liability of the issuer, prepaid, and a multi-purpose means of payment. Examples of e-money are multi-purpose prepaid cards issued by the major credit card networks, as well as stored-value cards for public transport that are also accepted at the point of sale (POS) and PayPal balances. Recent developments related to these schemes will be discussed in the next section. Note that decentralized e-money schemes such as Bitcoin do not satisfy this definition because there is no issuer and thus they do not constitute a liability of any sort. As such, they are not considered in this paper. For a short description of Bitcoin, see Box 1.

For our discussion, we also distinguish between e-money and e-payments. By e-payments we refer to electronic payment methods that allow users to access funds in their deposit or credit accounts in financial institutions to initiate payments; for example, debit and credit cards, Internet banking, and some mobile payment schemes. Given the limited developments of e-money so far and the fast pace of innovations in e-payments, we will broaden our discussion on policy implications and oversight to include innovative uses of conventional e-payment schemes.

2 Recent Economic and Technological Trends and Developments

2.1 Global landscape

Globally, the adoption of e-money products has been slower than had been expected 15 years ago. All the same, there has been a diversity of experience in regard to

[2] This definition is similar to the definitions used by the European Parliament and Council (2009) and Financial Services Authority in the United Kingdom (2011).

the success and failure of various e-money schemes.[3] The longest-lasting e-money schemes have tended to be concentrated in cash-intensive economies, especially those in East Asia, Africa and Europe. Many of these e-money schemes were introduced to fill a particular gap in the retail payment space, such as paying for public transportation, serving the unbanked population or facilitating payments for online purchases.

In many of the cases in East Asia, the scheme was originated by a public transportation company (or consortium of companies) as a means of developing a more efficient and convenient means of payment for public transport usage. Most of the prepaid e-money card products developed for such applications have operated off-line and tended to be contactless, to take advantage of speed and convenience considerations. Over time, there have been attempts to expand the use of these e-money products into fields such as retail transactions. However, there are only a few cases where such attempts have been successful. One notable success is the Octopus card in Hong Kong, used both for public transport and retail transactions.[4] It is estimated that about 40 per cent of the aggregate value of transactions is now non-transport related.

In some African countries, the lack of infrastructure such as landline phones and limited access to banking has encouraged the development of mobile money systems, where monetary value is stored in an account accessible by a mobile handset, a relatively low-cost telecommunication device. The M-PESA scheme has been a great success in Kenya and has been introduced in other countries in Africa and Asia. Transfers of monetary balances to other users with Short Message Service (SMS) technology is still the most common use of M-PESA.

There have been e-money schemes operating in a number of European countries for up to 15 to 20 years. These schemes have typically involved a prepaid anonymous card that operates off-line. Such electronic purse systems have generally been run by bank consortiums. Core uses have been for small-value transactions such as public transport, car parking, vending machines and payphones. In general, these card systems have been less successful than those in East Asia. In one case (Denmark), the e-money

[3] See Boxes 2 and 3 for a more detailed description of some of the more notable examples and some statistics.
[4] See CPSS (2012), Hong Kong Legislative Council Secretariat (2008), and the Octopus card website.

system (Danmont) ultimately failed after limited success for a few years, while in another case (Mondex) the product failed to find a competitive market niche. In other cases, such as Germany's GeldKarte, the e-money schemes appear to have been losing market share to conventional debit card systems in recent years. In particular, the card is not contactless and thus is not very convenient for purposes such as buying tickets for public transport. While the card can also be used for making Internet payments, this requires the purchase of an expensive reader to connect to a computer.

For international e-money schemes, main examples are prepaid cards issued by credit card networks, as well as some server-based e-money schemes such as PayPal. Multi-purpose prepaid cards that are reloadable, offered by Visa and MasterCard, are typically accepted wherever these credit cards are accepted. Consumers do not require a bank account to access this payment product, and no personal identification number (PIN) or signature is required when using the card. The high fees charged to cardholders, the relatively large limit on the value stored on the card (up to $10,000 in Canada), as well as its anonymous nature have raised issues such as consumer protection and anti-money laundering. As a result, a number of countries are introducing new legislation to regulate these cards.[5]

While most of the server-based e-money schemes currently focus on online purchases, companies such as PayPal are starting to move into the POS environment. In the case of the PayPal scheme, payment from a prepaid PayPal account is the default payment method. However, the PayPal scheme operates within the banking system, since the PayPal account is funded either through transfers from a bank account or by credit card payment.

Achieving general acceptance from merchants has been an important stumbling block for many e-money schemes, especially those that involve only non-banks. In many cases, acquiring enough merchants to accept the scheme could prove very difficult.[6]

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[5] In October 2012, the Canadian government announced that it was extending the existing consumer protection framework to prepaid payment products. The *Prepaid Payment Products Regulations* are expected to come into force on 1 May 2014 and apply to all federally-regulated financial institutions that issue prepaid payment products.

[6] For example, in the case of the Octopus card, being the acquirer itself requires Octopus to contact the merchants directly and set up the terminal for them.

Also, for schemes that primarily rely on fees charged to merchants or other sellers of goods and services as their main revenue source, in some cases these fees may have to be higher than more conventional payment methods because of their smaller scale.

Existing and potential e-money products are facing substantial competition from other retail payment methods. Furthermore, e-money devices that store monetary value may not necessarily be viable in comparison to improvements in payments systems that transfer monetary value between financial institution accounts, such as contactless debit and credit cards. To illustrate this point, consider the Oyster card, a stored-value contactless smart card used on public transport based in Greater London, England.[7] The Oyster card is not an e-money scheme yet because it can be used only to pay for public transport. However, it is already facing competition from contactless EMV cards in its transportation applications.[8]

Future retail payment innovations are likely to involve non-financial institutions and the use of new business models. For instance, such business models might involve partnerships between combinations of mobile phone carriers and hardware producers, social networks, data processors, financial institutions and payment networks. One potential player might be Google with its Google Wallet product, which allows consumers to use their credit and debit cards stored in the wallet for both POS and online purchases.[9] Both Visa and MasterCard are also introducing similar mobile wallet products. The increased involvement of non-banks is likely to pose new oversight and regulatory issues as well as additional implications for central bank policy.[10]

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[7] The success of many of these stored-value schemes, particularly for public transportation, can be attributed to their speed of transactions.

[8] EMV stands for Europay, MasterCard and Visa, a global standard for chip cards and chip card capable POS terminals and automated teller machines (ATMs) for authenticating credit and debit card transactions. The combination of EMV and Near Field Communication technology will enable use of EMV cards for contactless payments. There was an unsuccessful introduction of EMV cards on public transport in London during the 2012 London Olympics. While the e-money scheme is somewhat less secure than an EMV card, it seems that consumers are willing to trade off security for speed. In many cases, the risk is mitigated by a low limit on the maximum balances on such cards. For instance, the average Octopus cardholder maintains an average balance equivalent to about US$15, which is adequate for using the public transportation system over a two-week period. The maximum balance allowed is around US$125.

[9] Google recently decided to drop prepaid accounts from its Google Wallet and thus is focusing on the mobile application of conventional payment cards.

[10] The CPSS has formed a working group on non-banks to study the involvements of, and issues raised by, non-banks in CPSS countries.

2.2 The Canadian experience

Relatively few e-money products are broadly used or even currently available in Canada.[11] There are some multi-purpose network-branded prepaid cards, as well as some mobile payment schemes such as PayPal Mobile and Zoompass (see Box 4).[12] Finally, the Presto Card is a smart card-based fare-payment system for public transit in southern Ontario. This system is not currently considered to be e-money since it is used only for public transportation.

According to a Canadian Payments Association report (CPA 2012), e-wallets and electronic person-to-person (P2P) payment transactions combined represented a total of nearly $10 billion in 2011, but are only a small portion of the Canadian retail payments volume (0.1 per cent). Still, their volume of transactions grew at almost 40 per cent annually since 2008; see Figures 1 and 2. Similarly, the share of prepaid cards in overall retail payments transactions in 2011 remained small at 2 per cent in volume and 0.6 per cent in value. However, prepaid cards payment values rose at a rapid rate of 47 per cent annually between 2008 and 2011, while payment volumes more than doubled, surpassing automated banking machine (ABM) volumes and reaching about half of the volume of cheque payments. Average transaction sizes for prepaid cards increased to $115 in 2011, from under $85 in 2008. Open-loop prepaid cards (largely Visa and MasterCard gift cards) accounted for just over 80 per cent of the total value of prepaid card transactions in 2011. According to industry experts, the expansion of open-loop prepaid card activity is largely displacing debit and credit card transactions (Euromonitor International 2011).

Virtually all of the competition for cash in the Canadian retail payments environment in the past 20 years has come from traditional electronic payment instruments such as debit and credit cards. As a result, the share of POS payments taken by cash has declined markedly over this period (Figure 3). In particular, there was a surge in the use of debit cards after its national rollout in 1994, with this payment instrument

[11] Much of the discussion of the Canadian situation in this section is based on Arango et al. (2012).
[12] The Royal Canadian Mint has developed a prototype of a digital currency platform called MintChip. Transactions would be anonymous, almost instantaneous and likely mainly used for small-value transactions. In 2012, the Mint held a MintChip Developer Challenge where it asked software developers from across North America to test the MintChip technology. In April 2014, the Mint announced that it had stopped the development of MintChip and was looking to sell the business.

being particularly heavily used for payments in the range between $25 and $50.[13] Consumers appear to have focused on the usefulness of debit cards as a means of avoiding theft and fraud, owing to the requirement for verification with a PIN. Credit card use has risen considerably since the early 2000s, in part owing to the increasing number of rewards programs associated with credit card use. Credit card use has tended to dominate for retail transactions with values higher than $50, since most rewards tend to be proportional to the transaction value. Credit cards are also by far the predominant payment method for online transactions in Canada.

Even so, as Figure 4 shows, bank notes in circulation in Canada have been growing more or less in line with the economy since 1977. It would appear that cash holders have placed increased emphasis on the use of cash as both a store of value and for precautionary purposes, especially over the past two decades when the cash share at the POS has been declining as people have made increasing use of credit and debit cards.[14] The relatively low and stable inflation, as well as the low interest rate environment, since the early 1990s have contributed to lower costs of holding cash. We also observe that the demand for cash, particularly large-denomination bank notes, increased considerably during the 2007–09 global financial crisis. Similar trends appear to be evident in other countries, where the cash share of POS transactions has also been in a long-term decline (such as the Netherlands and the United States).

Extensive innovative activity regarding retail payment methods in Canada is under way. Many of the innovations are intended for lower-value transactions, where cash is still the predominant payment method. These particular innovations tend to focus on improving the speed and convenience associated with traditional electronic payment methods such as debit and credit cards. For instance, contactless credit cards using Near Field Communication technology have been available for several years in the Canadian retail marketplace. While their share of overall POS transactions is still relatively low, they have been growing at a rapid pace over the past few years. Contactless debit cards

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[13] There is explicit evidence on the usage of debit cards for different transaction value ranges in the Bank of Canada's 2009 Methods-of-Payment Survey. See Arango and Welte (2012).

[14] Bank notes are also likely to be held for transactions in the underground economy. However, there is no conclusive evidence that the underground economy has been growing over the past few decades. For some estimates of the size of the underground economy, see Morissette (2014) and Dunbar and Fu (2014).

(the Interac "Flash" product) began to be rolled out in the autumn of 2011. Mobile phone payment products for the POS are in the process of being introduced in Canada. Several partnerships have been formed between banks and mobile phone carriers to introduce mobile payment solution products.[15] However, a substantial increase in the adoption and use of private sector e-money products seems unlikely in Canada, at least over the near term.

While notes in circulation have been growing at more or less the same rate as the economy over the past few decades, there are important challenges on the horizon. The retail payment innovations currently being introduced into the Canadian marketplace, especially innovative uses of existing e-payments, could lead to a further reduction in the use of cash for retail purposes over the longer term.[16] On the other hand, the implications for the use of cash of some of the structural and regulatory developments under way are less clear. For instance, merchant restraint rules imposed by the credit card networks prohibit merchants that accept Visa or MasterCard from applying a surcharge on purchases by customers paying with a particular type of credit card, or from refusing to accept particular cards within a credit card brand. Any changes to these rules could affect the use of credit cards and thus the use of cash and debit cards.[17] It is important for the Bank to continue to monitor both e-money and e-payment developments and study their implications for the demand for bank notes.

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[15] For instance, CIBC and Rogers Communications introduced a Mobile Payment App in 2012, allowing certain CIBC credit card customers to make retail contactless credit purchases with selected smartphones. A similar partnership between CIBC and Telus was announced in February 2014. RBC and Bell Mobility have also entered into a partnership to facilitate the rollout of the RBC Wallet, which allows clients with either Interac Flash or Visa payWave accounts to make small-value payments (generally under $50) with selected smartphones.

[16] For a study of the impacts of retail payment innovations on cash usage in Canada, see Fung, Huynh and Sabetti (2012).

[17] For a detailed discussion of these issues, see Arango et al (2012).

3 Implications for the Central Bank's Balance Sheet, the Implementation of Monetary Policy and the Promotion of Financial Stability

While cash is likely to be around for a long time, it remains useful to study the policy issues associated with the potential gradual demise of cash and its replacement by privately-issued e-money or e-payment products. Among these issues are the implications of such a development for the Bank's balance sheet and its seigniorage revenue, and, as a result, its ability to implement and conduct monetary policy and promote financial stability.[18]

3.1 The Bank's balance sheet and seigniorage revenue

Reserve requirements were phased out in the early 1990s and bank notes now constitute the single largest liability of the Bank, accounting for around 70 per cent of its balance sheet and representing around 3.5 per cent of GDP (Figure 5). As previously mentioned, while this fraction has been fairly constant over past decades, new technological innovations could lead to a further decrease in the demand for cash. It is hard to predict how fast such a decrease would be at this point; however, it could have significant implications for the Bank's seigniorage revenue.

Since bank notes in circulation represent non-interest-bearing central bank liabilities, a substitution of cash for e-money or e-payment products would lead to a corresponding decline in central bank asset holdings and in the interest earned on these assets that constitutes central bank seigniorage revenue. In Canada, the bank note liability is supported by the Bank's financial assets, mainly in the form of Government of Canada bonds and treasury bills. The Bank of Canada's financial assets and the revenues generated support its operational independence to conduct monetary policy by providing an independent revenue stream outside of the government's budget process. A portion of this revenue is used to fund the Bank's operations and reserves; the remaining net

[18] Some of these issues have previously been analyzed in the mid-90s as part of the work done in a G-10 committee chaired by Chuck Freedman of the Bank of Canada. A short summary of this work was published in BIS (1996). For a more detailed discussion, see Freedman (2000). Most of the conclusions of this work still hold.

revenue is remitted to the Receiver General periodically throughout the year. Such revenue fluctuates, not only as the bank note liability changes, but also as the interest earned on financial assets varies. As Figure 6 shows, controlling for interest rates, net seigniorage revenues have been fairly constant for the past 20 years, being in the order of $1.6 billion (0.09 per cent of GDP).

While a significant loss of revenue could raise concerns regarding the Bank's operational independence and lead to a significant loss of government revenue, such a large decline in the demand for cash is very unlikely in the foreseeable future.[19] As of end-2013, bank note holdings per adult Canadian were $2,300 and the $100 notes accounted for more than 50 per cent of the value of currency in Canada. As such, Canadians would have to stop holding large-denomination notes for seigniorage revenue to decline significantly. Survey data show that cash is mainly used for lower-value transactions (Arango et al. 2012) while large-denomination bank notes are likely held for non-transactional purposes, such as precautionary and store of value. While retail payment innovations could lead to a decrease in the demand for cash for transactional purposes, it is unclear what effects they might have on its other functions.[20] Specific features of new payment instruments, such as convenience, anonymity, speed and wide acceptance, are important in determining the future decline of the demand for bank notes. More survey data on methods of payment are needed to monitor these trends and better understand consumer and merchant methods-of-payment choices.

3.2 Implementation of monetary policy and the promotion of financial stability

While a significant reduction in cash demand could lead to shrinkage of the Bank's balance sheet, such shrinkage is unlikely to impair the Bank's ability to conduct monetary policy as long as there is a demand for Bank of Canada settlement balances. However, some adjustments might be required in the way monetary policy is

[19] Seigniorage revenues would have to decline more than 60 per cent from their current level for the Bank to be unable to cover its operational costs.

[20] Presumably, the demand for cash for precautionary and store-of-value purposes is linked to its role as a means of payment and thus its liquidity. In an extreme scenario in which economic agents would stop using cash as a medium of exchange, it is unclear whether cash's other functions would survive, particularly given that cash is dominated in rate of return.

implemented. Also, there could be possible changes to the transmission mechanism, the velocity of circulation of different monetary aggregates and inflation dynamics.

The Bank of Canada's method of implementing monetary policy is closely linked to the system through which payments clear and settle daily in the Large Value Transfer System (LVTS).[21] The Bank establishes an operating band (of typically 50 basis points) for the overnight interest rate to influence other short-term interest rates.[22] The ceiling of the band (the Bank Rate) is the rate paid by banks to the Bank of Canada on end-of-day advances, while the floor (deposit rate) is the rate paid by the Bank of Canada to banks on their end-of-day deposits at the Bank's Standing Liquidity Facility. Since the introduction of the LVTS in 1999, the level of settlement balances in the system has usually been targeted at zero or greater (currently $150 million). On fixed announcement dates, the Bank of Canada communicates the target for the overnight rate (typically at the centre of the band). The overnight rate typically stays within the band near the target, since participants are aware that they will earn at least the deposit rate on positive balances and need not pay more than the Bank Rate to cover negative balances. Furthermore, any LVTS participant with a deficit position is aware that there is at least one other participant in the system with an offsetting surplus position who is a potential counterparty for transactions at market rates. The Bank can also, if necessary, encourage the overnight rate to settle near this target by carrying out a limited amount of repo (special purchase and resale agreements) or reverse repo (sale and repurchase agreements) operations if the overnight rate diverges appreciably from the target at mid-day. While the infrequency and modest size of these open market operations on normal days suggest that a relatively small balance sheet might be sufficient, special circumstances could arise in which the Bank might not be able to implement operations on a large-enough scale if it lacked sufficient assets on its balance sheet.

The Bank's financial assets also support the financial system function. Every day, relatively small advances are routinely made under the Bank's Standing Liquidity Facility. Financial intermediaries are usually able to allocate liquidity among themselves

[21] For a backgrounder on the LVTS, see http://www.bankofcanada.ca/wp-content/uploads/2010/11/large_value_transfer_system.pdf.
[22] For more details, see Bank of Canada (2010).

without having to make significant use of the Bank's collateralized advance and deposit facilities. However, in exceptional circumstances, advances could become significant if the Bank is required to provide emergency lending assistance to a liquidity-challenged financial institution. Advances from the Bank can be funded by the outright sales of treasury bills, government securities repurchase agreements (repos) or the issuance of interest-bearing liabilities (deposits).[23] The Bank might also need to intervene to promote the stability of the Canadian financial system, as illustrated during the recent financial crisis. Pursuant to Section 18 (g) of the Bank of Canada Act, if the Governor is of the opinion that there is a severe and unusual stress on a financial market or the financial system, the Bank may buy and sell from or to any person any securities and any other financial instruments, to the extent determined necessary by the Governor. A substantial reduction in the Bank's balance sheet could compromise the Bank's ability to provide such liquidity.

In principle, central banks have several policy options to mitigate the impacts of shrinkage of their balance sheets. Firstly, the central bank could issue interest-bearing liabilities, such as central bank bills, or pay interest on reserve balances to induce private banks to hold larger deposits at the central bank. Currently, the Bank of Canada does not have such powers (with the exception of what was stated in footnote 23). The Government of Canada might also increase its deposits at the central bank although concerns regarding the operational independence of monetary policy of the central bank could arise.[24] Such measures could increase the size of the Bank's balance sheet but would not necessarily address the loss of seigniorage revenue. Secondly, the Bank of Canada could pursue the imposition of non-interest-bearing reserve requirements on e-money or traditional bank deposits. This would increase seigniorage revenues; however, non-interest-bearing reserve requirements are regarded as a distortionary tax and were

[23] According to Section 18 of the Bank of Canada Act, the Bank may pay interest on the deposits from any bank, authorized foreign bank or other member of the Canadian Payments Association if the money deposited is to be used for the purpose of making loans or advances for periods not exceeding six months to members of the Canadian Payments Association on taking security in any property that the institution to which the loan or advance is made is authorized to hold.

[24] The Government of Canada recently created a $20 billion deposit as part of its Prudential Liquidity-management Plan. Such deposit is to be invested in Government of Canada bonds and treasury bills. However, currently, the memorandum of understanding between the Government and the Bank does not foresee the use of these assets for monetary policy or financial stability operations.

phased out in Canada in the 1990s. Finally, the Bank of Canada could consider issuing e-money itself, though this could limit competition or reduce incentives to innovate. We will discuss this option in more detail in the next section. As an alternative, the central bank could partner with e-money issuers and serve as their banker, holding the funds in the scheme on its balance sheet and settling payments. Whether the Bank would pay interest or not on these e-money deposits would determine the effects on the seigniorage revenue.[25]

4 Other Public Policy Issues

4.1 Safety and efficiency

While it is unlikely that e-money issued by the private sector would pose any systemic risk to financial systems, the failure of a major e-money issuer could lead to significant financial losses, loss of confidence and disruption of trade, and could have significant economic effects. Furthermore, there could be reputation risk for the issuer and for the Bank of Canada or other authorities perceived to be responsible for the well-being of the financial system and for public confidence. Globally, there seems to be an increased public expectation for central banks to prevent disruptions and defaults of major retail payments systems. Currently, several central banks not only have oversight of systemically important payments systems but also of retail payments systems of economic (system-wide/prominent) importance.[26]

In Canada, to date, there is no comprehensive regulatory regime surrounding stored-value schemes and no prohibition on the issuance of e-money or the operation of Internet or mobile payment schemes by non-financial institutions.[27]

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[25] Imposing non-interest-bearing reserve requirements, the issuance of e-money, and the payment of interest on e-money deposits would require legislative changes.

[26] The European Central Bank considers a retail payments system to be prominent if it plays an important role in the processing and settlement of retail payments and if its failure could have major economic effects and undermine the confidence of the public in payments systems and in the currency in general.

[27] On 24 October 2012, the Minister of Finance and the Financial Consumer Agency of Canada announced new federal regulations governing prepaid open-loop cards issued by federally regulated financial institutions in response to concerns regarding the terms and conditions (fees, information disclosure, expiration) associated with these products. Final regulations are to come into effect on 1 May 2014. Similar

Future retail payment innovations are likely to involve non-banks, especially in the areas of Internet and mobile payments. Participation of these institutions in the retail payments market could enhance competition and increase efficiency by introducing new products that reduce transactions costs and increase convenience. However, most of these institutions are unregulated and could pose safety and consumer protection concerns. For example, if one of the major non-bank payment providers fails, it could cause serious disruption to the economy and undermine confidence in payments systems. Some central banks that currently act as retail payments system regulators are consequently reviewing their regulatory framework in view of the growing importance of non-bank payment services. Central banks need to know more about how non-bank retail payments systems work and the risks raised by those systems. One issue of general interest is whether non-financial institutions should be allowed to issue e-money products and whether existing banking or other regulations apply to e-money arrangements. For example, do e-money products constitute deposit taking or a banking activity? In the absence of an obligation to repay the money stored on the device following a demand by the cardholder, e-money products fail to meet the current legal definition of "deposit" in Canada.[28] As a result, a range of issues regarding the safety of these balances could arise. What should be the requirements for a non-financial issuer?

The safety of the funds held in the scheme is one of the main issues surrounding e-money products. The failure of an e-money scheme could lead to non-negligible

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consumer protection regulation exists at the provincial level for closed-loop prepaid cards. The Minister of Finance also announced in September 2012 that the Code of Conduct for the Credit and Debit Card Industry in Canada will be expanded to include mobile payments, and released a proposed Addendum to the Code for public consultation.

[28] The Bank Act definition of "deposit" (subsections 413.2(2), 413(5)) refers to the definition in the Canada Deposit Insurance Corporation Act:

... the unpaid balance of the aggregate of moneys received or held by a federal institution or provincial institution, from or on behalf of a person in the usual course of the deposit-taking business of the institution, for which the institution:

(a) has given or is obligated to give credit to that person's account or has issued or is obligated to issue a receipt, certificate, debenture (other than a debenture issued by a bank to which the Bank Act applies), transferable instrument, draft, certified draft or cheque, traveller's cheque, prepaid letter of credit, money order or other instrument in respect of which the institution is primarily liable, and

(b) is obligated to repay the moneys on a fixed day, on demand by that person or within a specified period of time following demand by that person, including any interest accrued or payable to that person.

financial losses and inconvenience for the e-money product holder.[29] As e-money schemes grow and the products become more widely used and accepted, the amount of funds in the schemes, such as PayPal, could become significant. Currently, deposit insurance is not applicable to stored-value or e-money accounts in Canada.[30] Most jurisdictions that currently regulate e-money schemes typically impose minimum capital requirements for schemes above a certain size and restrict the investment of funds in the scheme.

The appropriate balance between the efficiency and the safety of payments systems is key to an effective regulatory framework. While for systemically important payments systems safety has greater weight given the level of systemic risk, for retail payments systems efficiency concerns may be given greater weight. Beyond safety, important public policy objectives for retail payments include the promotion of innovation, open access, common standards and interoperability, efficient and transparent pricing, and protection of user interests. However, the design of an appropriate regulatory regime that could accommodate these objectives has proven to be difficult, as in the case of the European Union, which had to revise its regulatory framework to encourage more entry by e-money issuers.[31] Most jurisdictions distinguish between, and have distinct regulatory approaches for, e-money and retail payments systems. Box 5 provides examples of e-money regulatory frameworks in other jurisdictions. While for retail payments systems the typical approach is designation, for e-money schemes when non-banks are involved the approach typically involves some form of registration, licensing or approval.

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[29] The magnitude of the losses depends on the limit on the device. For example, in the case of the Octopus card in Hong Kong, the amount is relatively small. But in the case of some prepaid Visa and MasterCard cards in Canada, the amount can be quite large.

[30] Currently, in the United States, open-loop prepaid cards are covered by the Federal Deposit Insurance Corporation.

[31] In the European Union, a regulatory framework was first put in place in 2000 by the First E-Money Directive. But in 2008, the European Commission concluded that the e-money market was developing more slowly than expected and that the Directive was holding it back. The result was the Second E-Money Directive of 2009, which was designed to encourage new entrants to the market by imposing lower capital requirements and a lighter regulatory regime for small e-money issuers.

4.2 Protection of user interests

Another major concern relates to the transparency of the e-money scheme regarding the rights and obligations of all parties involved, including consumers, retailers, issuers and operators. Schemes differ as to when payment is final and also as to whether the consumer or the merchant bears the credit, settlement and other risks until settlement occurs. A particular concern relates to the legal treatment of unredeemed e-money balances. With new payment schemes involving new business models and partnerships between data processors (e.g., Google), mobile carriers, social networks (e.g., Facebook) and financial institutions, concerns also arise regarding data protection and privacy issues resulting from misuse of customer data. Consumer protection legislation and regulations, such as the federal government regulations concerning prepaid cards soon to come into effect, and other possible policy changes which may affect credit card acceptance costs for merchants, will have a significant impact on defining the future retail payments landscape.[32]

4.3 Legal, security and law enforcement issues

Beyond safety, efficiency and consumer protection issues, new retail payment innovations raise a number of legal, security and law enforcement issues. All retail payments are vulnerable to security breaches in some way, and steps can be taken to minimize the potential risk. The security breach of an e-money scheme could occur at the consumer, merchant or issuer level and could involve attempts to steal consumer or merchant devices, create fraudulent payment messages that are accepted as genuine, or alter the software functions of a product. Security attacks would most likely be for financial gain, but could also aim to disrupt the system. There are specific security features available to protect e-money products. These include tamper-resistant chips, sophisticated encryption techniques, the use of a PIN, central reconciliation registries and maximum limits on the amounts that can be held on the e-money product and on the

[32] As well, the federal government recently asked for comments on possible enhancements to the existing framework for financial consumer protection.

transaction value. Public institutions can play an important role in promoting these security standards.

Many of the features relevant to the convenience and security of e-money may increase its attractiveness for money laundering and other criminal activities. Its use for such purposes would depend upon the extent to which e-money balances can be transferred without being tracked, the maximum amount that can be held on an e-money device and its record-keeping capacity, and the ease with which e-money can be moved across borders. The cross-border nature of several e-money schemes, such as PayPal, makes this a particularly challenging issue requiring international coordination and co-operation for anti-money laundering purposes. When e-money payments are made across borders, it may be difficult to ascertain the extent to which the scheme falls within the scope of a particular jurisdiction.

5 Potential Roles of the Central Bank

In general, central banks have served three roles in retail payments systems – facilitator (or catalyst), overseer, and operator.[33] The extent of these involvements varies across countries, reflecting different histories as well as institutional and legislative arrangements. Also, the objectives of central bank retail payments policies vary across countries, though most include the objectives of safety/stability and efficiency. Some central banks, such as the U.S. Federal Reserve, also include accessibility, while the Reserve Bank of Australia aims to improve competitiveness as well. Here, we will employ the same framework in examining the potential roles of the central bank with regard to e-money, grounding our study in broad public policy discussions.

5.1 Facilitator/catalyst role

A central bank can be involved in a wide range of activities as a facilitator or catalyst in retail payments. Many central banks maintain contacts with private sector players as well as conduct research, monitor developments and promote discussions on retail payment issues. Some central banks are taking initiatives to promote

[33] For a more detailed discussion, see CPSS (2003, 2005); Oliver and Weiner (2009); Weiner (2008).

standardization, best practices and interoperability among various potential players, which are important for successful innovations in retail payments. Yet other central banks see accessibility to efficient retail payments for all citizens as an important objective, especially in countries where the unbanked/under-banked population is relatively large.

So far, however, central bank involvement as a facilitator or catalyst of e-money has generally been limited to research and monitoring.[34] It is also interesting to note that some of the more successful e-money schemes, such as the Octopus card in Hong Kong and M-PESA in Kenya, had little central bank involvement at the beginning. In these cases, private sector participants were able to develop an e-money scheme that met a need and attracted sufficient users to benefit from the network effect.

5.2 Oversight role

Central banks' involvement as regulators or overseers of retail payments systems varies across countries and has evolved significantly in recent years. While central banks traditionally have played a role in the regulation and oversight of systemically important payment, clearing and settlement systems (typically large value payment systems), as is the case in Canada, a few have also increased regulatory and oversight responsibilities in retail payments. For example, the Reserve Bank of Australia regulates interchange fees and the U.S. Federal Reserve sets debit card fees.

A number of important issues need to be considered in regulating retail payments, since they often involve a large number of stakeholders over a range of areas; for example, mobile payments usually involve financial institutions and mobile carriers, and can raise safety, security and consumer protection issues. It is not always clear which public institution is best positioned to oversee and regulate retail payments systems. In many cases, co-operation may be required among a number of regulators. Moreover, in regulating innovative retail payments systems such as e-money issuers, the design of the appropriate regulatory regime needs to balance between promoting innovation and safety. Such a balance, however, has proven to be difficult, as discussed in the previous section. To avoid stifling innovation and competition, regulators can also adopt a wait-and-see

[34] A recent example is the paper by the European Central Bank on virtual currencies (ECB 2012) and Gans and Halaburda (2013) on private digital currencies such as Facebook credits and Amazon coins.

approach by monitoring closely developments and constantly assessing their implications. The risk of such an approach is that regulators might not be able to respond quickly enough to certain developments and as a result could affect confidence in retail payments systems.

5.3 Operator and issuer role

Central bank involvement in retail payment operations varies considerably across countries. According to the World Bank's 2010 survey, the central bank was the operator of 53 per cent of the cheque clearing houses in 112 countries and 40 per cent of the automated clearing house (ACH) system in 92 countries.[35] This percentage is particularly high in low-income countries, with 84 per cent of cheque clearing houses and 75 per cent of ACH systems operated by the central bank. Compared to the 2008 survey, involvement by central banks in operating these systems has decreased slightly. In Canada, the Automated Clearing and Settlement System, which clears the vast majority of retail payments items, is owned and operated by the Canadian Payments Association.[36] The Bank of Canada is not involved directly in retail payment operations.

For our discussion, we extend the operator role to include that of being an issuer of e-money. Currently, to the best of our knowledge, no central bank intends to issue e-money to the general public.[37] Instead, several central banks have attempted to promote the entry of private e-money issuers into the market by providing a clearly-specified regulatory environment.[38] Here we discuss briefly some public policy arguments for a central bank to consider issuing e-money directly.

We start with the premise that e-money can potentially increase the efficiency of the retail payments system and therefore that having a well-functioning e-money scheme can be welfare improving. However, it is not clear whether a private sector solution is

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[35] See World Bank (2010).

[36] The ACSS is a deferred net settlement system that handles paper-based payment items (mostly cheques), as well as small-value electronic payment items, such as point-of-sale (e.g., debit card) or automated banking machine transactions, and pre-authorized debits and credits.

[37] According to CPSS (2003), "At the moment, no CPSS central bank intends to issue e-money to the general public, although some have explicitly left this option open for the future."

[38] For example, the Financial Services Authority in the United Kingdom published a document on its electronic money approach, see FSA (2011).

going to emerge. Standardization, co-operation and interoperability are often regarded as major challenges for the private sector in developing well-functioning e-money schemes. While there are a small number of successful private e-money schemes around the world, these challenges could prove to be a major obstacle for the widespread introduction and adoption of private e-money in many countries. In this case, the central bank could consider becoming an e-money issuer.

Even in the case where there are a number of private e-money schemes, government intervention, including explicit government insurance, regulation and supervision may be needed to ensure safety and efficiency.[39] The government's decision of whether or not to issue e-money should depend on the relative costs and benefits of these two options to society: government intervention in the private provision of e-money and government issuance.

Finally, as discussed in section 3, issuing e-money is one of the options that a central bank could consider if its balance sheet is shrinking to a level that becomes a significant concern for its ability to implement monetary policy and to promote financial stability.[40]

There are a number of other considerations that need to be taken into account when considering the possibility of a central bank issuing e-money. First, central banks do not have a comparative advantage in issuing e-money, owing to a lack of market or technical expertise in this field. Second, having the central bank as an issuer may stifle innovation. Finally, there are operational, reputational and financial risks specific to the central bank in issuing e-money. For example, a serious security breach or operational outage involving central bank-issued e-money could affect public confidence in the central bank and thus could raise concerns about its ability to carry out other policy functions. The reputational and operational risks, while hard to assess at this point,

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[39] Weber (2014) studies the lessons learned from a privately-issued money system during the free banking era in the United States and the historical circumstances leading to government-issued money. He uses historical evidence to shed light on whether a privately-run e-money system can operate safely and efficiently. He finds that, with appropriate government intervention, including explicit government insurance, regulation and supervision, such a system might operate safely and efficiently.

[40] See also BIS (1996).

highlight the concerns about whether the central bank could have or could develop the expertise to ensure the smooth functioning and safety of e-money products.

At the moment, there seems to be no compelling case for the central bank to issue e-money directly, provided a well-regulated system of private sector e-money schemes can be established. Nevertheless, more research is required on the public policy arguments for the central bank as an issuer of e-money.

6 Conclusions

Well-functioning payments systems are the backbone of a strong economy and stable financial markets. Payments systems, especially retail payments, are changing rapidly in Canada and around the world, as new innovations, new participants and new systems continue to arise. While the demise of cash is not imminent, it is critically important for the Bank to continue to evaluate its role in light of these developments.

Recent developments in retail payments do not seem to seriously impair the ability of the central bank to implement monetary policy and promote the stability of the Canadian financial system. However, in the unlikely case that privately-issued electronic money and electronic payments completely replace cash and reduce the demand for central bank settlement balances, adjustments to the way the Bank implements monetary policy might be required.

New innovations and players in the retail payments field also raise concerns regarding safety and user protection. While there is fragmented legislation that covers some of these issues, Canada lacks a comprehensive governance and regulatory framework for retail payments systems. In response to this situation, the Department of Finance and the Bank have established and commenced work on a joint plan for the review of payments system governance.

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Boxes

Box 1
Bitcoin as an Example of Decentralized E-Money

Bitcoin is a decentralized (thus no issuer) and partially anonymous digital currency. Based on specialized open-source software, a set amount of Bitcoins is given to users in exchange for specific contributions to the operation of the Bitcoin system. Users can transfer Bitcoins among themselves or use them to purchase goods and services, provided they can find merchants willing to accept them. Bitcoins are not pegged to any real-world currency. However, Bitcoins can be bought and sold for national currencies through a number of "unofficial" Internet-based exchange platforms. Although Bitcoin automatic teller machines have been introduced in several major Canadian cities, very few Canadian merchants accept Bitcoins as a means of payment as of yet. There have been a considerable number of security incidents in which thefts of Bitcoins have taken place and, indeed, Mt. Gox, one of the largest Bitcoin exchanges, had to recently file for protection from its creditors in Japan as a result of a very large theft of Bitcoins in its custody. Central banks and other public authorities are studying and monitoring closely decentralized digital currencies such as Bitcoin. Bitcoin's users need to be aware of the potential financial risks to which they might be exposed, in light of the ongoing volatility of Bitcoin prices and the risk of the Bitcoin infrastructure (such as exchanges) being compromised.

Box 2
Examples of Successful E-Money Initiatives

Octopus Card in Hong Kong

- Contactless payment card with extremely fast transaction times.
- Operates off-line. Central clearing system reconciles all transactions on a daily basis.
- Most cards are anonymous.
- Mainly used for small-value transactions.
- Not as secure as EMV cards but that may not be an important issue, since typically only small balances are held on the card.
- Core use has been for public transportation. Still, almost half of the total value of transactions is now non-transport related.
- Octopus Cards Limited is regulated as a special-purpose deposit-taking institution by the Monetary Authority of Hong Kong. Octopus also voluntarily adheres to the Code of Practice for Multi-Purpose Stored Card Operations.
    - Ensuring a high degree of security and operational reliability of the system is a key requirement of the Code.

Statistics:

- In 2010, there were over 21 million Octopus cards in circulation (about 3 per capita).
    - There was a daily average of over 11 million transactions.
    - The average transaction value for the Octopus card is US$1 and the average value for a retail transaction is slightly higher, at about US$2.50.
- The average value held on an Octopus card is about US$15, which is adequate for using public transport over a two-week period.
- About 30 to 40 per cent of the transactions are non-transport related (in terms of value). The authorities have imposed a cap of 50-50 on transport and non-transport transactions.
- The cardholder has to place a refundable deposit worth about US$6 after first obtaining the card. There are no reloading or user fees.
- Octopus charges a 1 per cent fee to transport operators, and an undisclosed variable fee to merchants for the payment service.

Box 2 (continued)

M-PESA Scheme in Kenya

- An example of an e-money system where monetary value (E-float) is stored in an account accessible by a mobile handset.
- E-float balances can be sent to other users with Short Message Service (SMS) technology. This is still the most common use of M-PESA.
- E-float balances can also be used to pay for goods and services. Furthermore, they can be redeemed for regular cash.
- A network of agents is used to facilitate the loading of monetary value into the M-PESA account and for redemption for cash.
    - Some banking customers can transfer funds between banking and M-PESA accounts.
- Aggregate balances are held by M-PESA and deposited in bank accounts.
- Many consumers have access to cell phones, which helps to overcome the start-up problem associated with two-sided markets.
- Note that regular cash is still very much in the picture.

Statistics:

- Over 15 million M-PESA customers, conducting over 2 million transactions per day.
- M-PESA processes transactions worth about US$5 billion annually (17 per cent of Kenya's GDP).
- Over 35 thousand mobile money agents in Kenya, compared to just under 1,100 bank branches.
- Over 90 per cent of mobile money transactions in Kenya are conducted through M-PESA.

E-money in Japan

- About 24 per cent of households hold electronic money (both stored-value cards and server-based online services).
- Around 150 million stored-value cards had been issued as of March 2011 (slightly more than one card per capita).
- The number of e-money payment transactions rose nearly 150 per cent between 2007 and 2010.
- Stored-value cards are mainly used for transactions of less than the equivalent of Can$12.

GeldKarte (Germany)

- There were about 3.4 million active GeldKarte cards in 2011 (about 4 cards for every 100 persons in Germany).
    - The average amount of a GeldKarte transaction was 3 euros in 2011.
    - The average amount loaded onto a GeldKarte was 28 euros in 2011.
    - The value of GeldKarte payment transactions was about 0.1 per cent of the value of payment transactions made with a debit card in Germany in 2011.
- The number of GeldKarte payment transactions decreased about 22 per cent between 2007 and 2011.

Box 3
Examples of E-Money Initiatives That Failed

Danmont

- One of the first European e-money products, it was launched in Denmark in 1992.
- It was used for small-value payments, mostly at unmanned points of sale.
- Merchants had to pay a fee to use Danmont. In contrast, Dankort (the national debit card) was free of charge for merchants (and consumers).
    - Merchants also had to use a special terminal for the Danmont card.
- As a result, Danmont was little used at manned points of sale.
- Danmont was phased out in 2005.

Mondex

- This stored-value card (prototypes of which were available in the mid-1990s) had the capacity to replace physical cash.
- In the jurisdictions where it was introduced (such as the United Kingdom and Canada), the Mondex product failed to find a competitive niche relative to credit cards and debit cards.
- Most merchants failed to accept this product, since it was relatively slow to use and poorly integrated into their payment infrastructure.
- Most consumers failed to see any advantages over other payment methods.

Box 4
Selected E-Money Products Currently Available in Canada

Multi-purpose Prepaid Cards

- Preloaded monetary balance on the card is drawn down at the time of a retail transaction. Online authorization appears to be required in all cases.
- Many of these card products can be reloaded and there is a maximum monetary value that can be put on the card.
- Offered under all three of the major credit card brands, but by only a few financial institutions.
- Relatively high fees for cardholders. Therefore, they are not very popular.
- In October 2012, the federal government announced it was extending the existing consumer-protection framework to these payment products, particularly to those issued by federally regulated financial institutions.

Mobile phone payments (e.g., PayPal Mobile, Zoompass)

- Both PayPal Mobile and Zoompass have prepaid accounts that can be funded from a bank account or a credit account.
- In both cases, monetary transfers can be made to users of each service.
- In the case of PayPal Mobile, online payments can also be made wherever PayPal is accepted.
- In the case of Zoompass, retail purchases can be made with a prepaid MasterCard product linked to the Zoompass account.

Box 5
Selected E-Money Regulatory Frameworks: UK and Hong Kong

In the United Kingdom, the Electronic Money Regulations of 2011 implemented the provisions of the *Second EU E-Money Directive*. These new regulations aimed to encourage more firms to set up electronic money schemes and introduce new protections and safeguards for their customers. Organizations that are not either a bank or a building society, or otherwise exempt under the Directive, must either be authorized by the Financial Services Authority (FSA) or registered with the FSA as a "small e-money issuer."

One of the major changes under the new law is that e-money issuers will be able to engage in activities other than issuing e-money. The UK government hopes this will encourage new market entrants such as mobile phone operators. Under the new regulations, a fully authorized e-money issuer must have initial and ongoing capital of the greater of €350,000 or an amount calculated in accordance with one of four methods that take into account various factors, such as payment volume and whether the firm carries on activities other than issuing e-money. Until now, authorized e-money issuers have been required to maintain an initial and ongoing capital of €1 million.

E-money issuers that carry on business activities other than issuing e-money will also be subject to additional prudential requirements. Small e-money issuers must maintain initial and ongoing capital of at least 2 per cent of the average outstanding e-money of the firm, but only if their business activities generate, on average, outstanding e-money of €500,000 or more. Cash invested in funds must be held in secure, liquid low-risk assets that are held by a custodian or placed in a segregated account. Alternatively, the firm may hold an insurance policy or bank guarantee to safeguard the funds. An additional safeguard is that customers should now rank above other creditors in access to those funds if the e-money issuer becomes insolvent.

Under the new regulations, e-money issuers must issue e-money to customers on receipt of funds at face value and without delay. They must also refund any outstanding balance (again, at face value) at any time if the customer requests it. Refund conditions, including any redemption fees, must be clearly and accurately reflected in the e-money issuer's terms and conditions and the customer informed of them before entering into the contract. Firms will need to consider how they handle dormant funds (i.e., e-money that has not been redeemed by the customer). There is, however, a new six-year limitation period, which means that e-money issuers will not be obliged to make a refund if over six years have passed since the date at which the contract was terminated.

In Hong Kong, a new regulatory framework for retail payment instruments and systems is currently being developed. It proposes to establish a licensing regime to the effect that no one shall issue Storage Value Facilities (e-money products) without obtaining a licence from the HKMA and being subject to the HKMA's supervision.The focus is on the protection of the funds in the scheme. The new proposed regime puts limits on the maximum amount that can be stored in each facility and imposes float management requirements, such as segregation of funds and restrictions on the investment of funds.

Figures

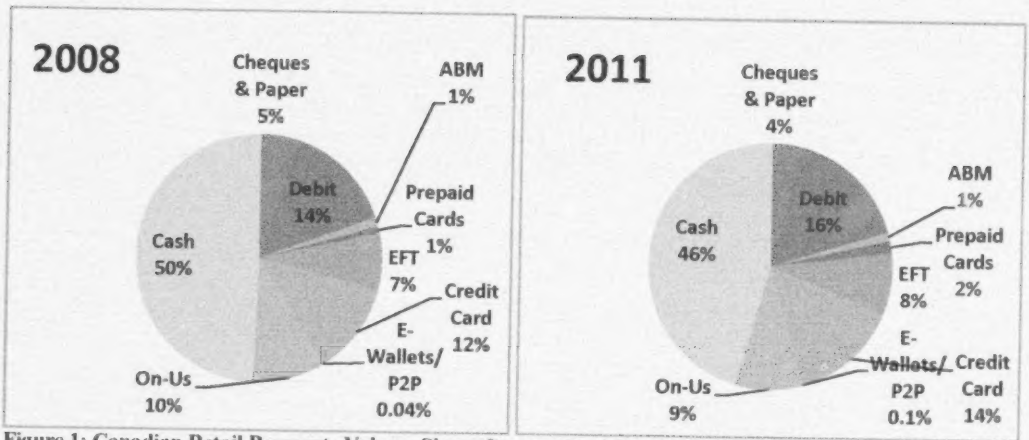

Figure 1: Canadian Retail Payments Volume Share. Source: Canadian Payments Association.

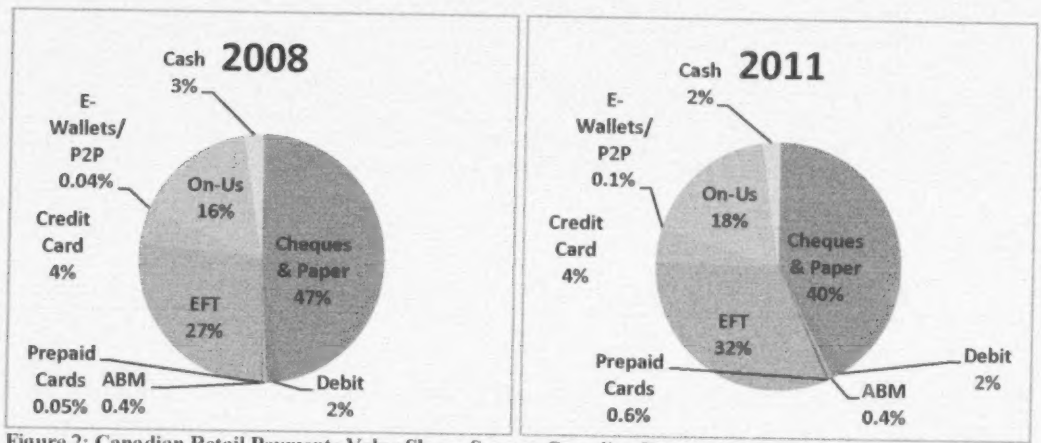

Figure 2: Canadian Retail Payments Value Share. Source: Canadian Payments Association.

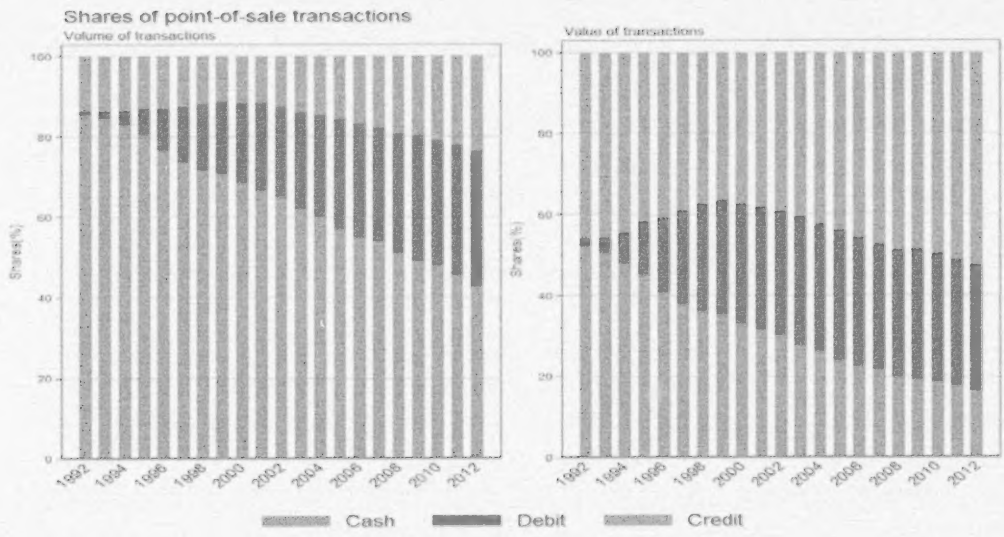

Figure 3: Share of value of point-of-sale transactions, by payment method.

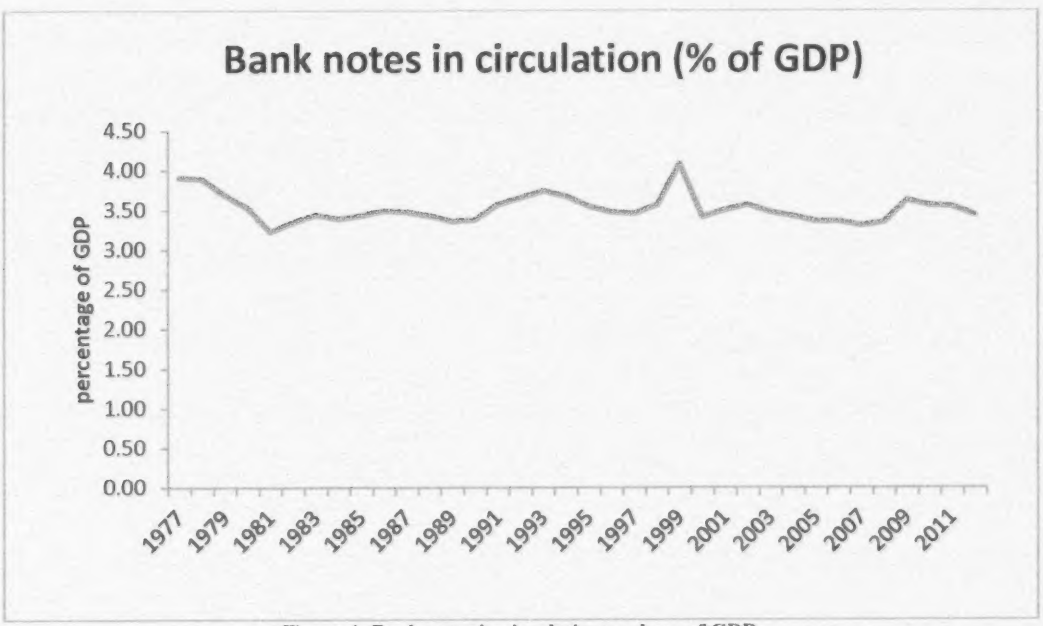

Figure 4: Bank notes in circulation as share of GDP.

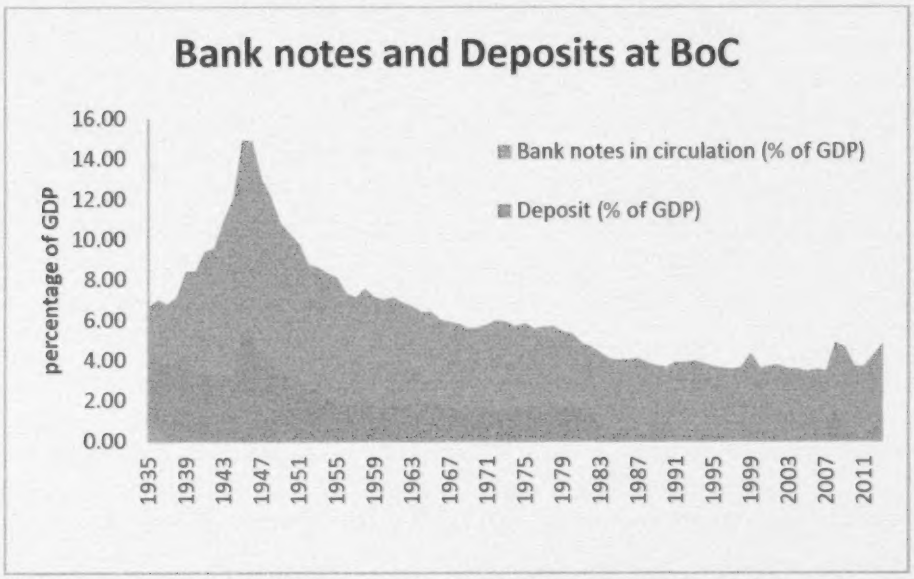

Figure 5: Bank of Canada liabilities as fraction of GDP. Source: Bank of Canada balance sheet and income statement data. Q2 data for 2012.

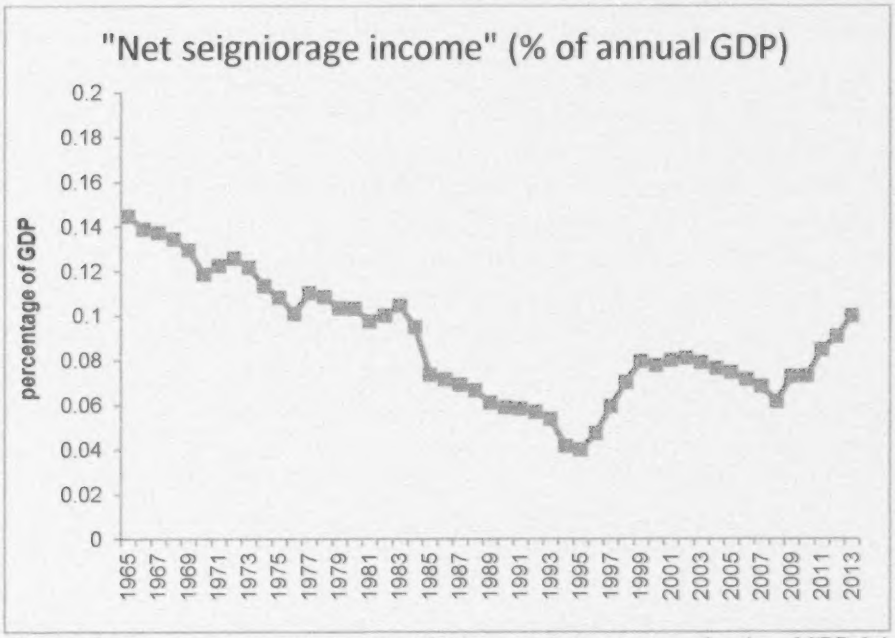

Figure 6: Net seigniorage revenue at constant 2011 average interest rates as fraction of GDP. Seigniorage computed as interest income from investments net of interest paid on deposits at BoC and the cost of the currency function. Q2 data for 2012. Source: Bank of Canada balance sheet and income statement data.